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PATENT SPECIFICATION

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DRAWINGS ATTACHED.

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Support System for

Laterally Removable Sash

1,002,338



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COMPLETE SPECIFICATION.

Window Construction.

We, GENERAL BRONZE CORPORATION, a corporation organised under the laws of the State of New York, United States of America, of Stewart Avenue, Garden City, Long Island, State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a window construction and more particularly to such construction including a sash balancer which may be used in either single hung or double hung window sashes.

For convenience we shall describe the sash balancers in connection with a single hung sash since the sash balancers of a double hung sash duplicate those of a single hung sash.

A primary object of the invention resides in the provision of a sash balancer that will at all times and at all positions of the sash be housed completely between the sash and the jamb of the window frame and which is so constructed and arranged that the complete sash balancer may be disconnected from the sash to permit the removal of the sash while the sash balancer remains secured to the jamb of the frame.

A further object of the invention is to provide a sash balancer of the above described type which will act to counterbalance the weight of the sash in its various positions of opening and closing.

A further object of the invention is to provide a sash balancer of the above described type which is formed as a self-contained unit which may be sold as such and installed on the jamb of the frame ready for the reception of the window sash by simple manual emplacement and which may thereafter be easily attached and correlated with the sash by a second simple manual operation.

In accordance with the present invention, there is provided a window construction comprising a frame having opposite channelled jambs, a sash slidable in said channelled jambs to positions toward opposite ends of the frame, a sash balancer comprising an elongated housing slidably mounted in the channel of one of said jambs to slide towards either end of said frame, means on said housing for maintaining said housing within said channel, means for releasably latching said housing to the adjacent jamb against movement longitudinally of said jamb, means on said housing engaging with said latching means to urge it toward its latching position when said sash is moved in one direction and a spring assembly attached to said housing and to said frame biasing said housing in a direction to cause engagement between one end of the housing and one end of the sash.

An example according to the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a view, partly in sectional elevation and partly in end elevation, showing a portion of a window frame and of a sash with the associated sash balancer, the sash being in its closing position and free to be moved vertically into various open positions;

Figure 2 is a similar view showing, however, the sash balancer locked to the window frame and the sash partly raised to a position which will enable it to be removed from the window frame;

Figure 3 is a horizontal sectional view, partly in perspective, taken on the plane indicated by the line 3—3 of Fig. 1 and looking in the direction of the arrows;

Figure 4 is a sectional view, taken on the plane of line 4—4 of Fig. 2 and looking in the direction of the arrow;

Figure 5 is a perspective view, partly in broken away elevation and partly in section

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showing the latching means at the upper end of the balancer.

Referring to the drawing, a window frame "F" and a sash "S" are illustrated. The jamb of the frame forms a sash-receiving channel "C" which is defined by a base 1 and flanges 2 and 3.

The side stiles of the sash are of open channel form and each is constituted by a base web 4 and flanges 5 and 6, the base web being provided with glazing means.

The space between the flange 3 of the frame and the flange 6 of the adjacent side wall of the sash is sealed by a seal 7 of plastics material which also acts to prevent a metal-to-metal surface contact. The flange 5 of the side rail of the sash carries a weather seal 8.

The side stiles of the sash extend only partially into the channels "C" of the frame on both sides of the window so that the sash may be moved deeper into one of the channels to permit its removal from the frame, it being normally prevented from removal except when in a partially open position by a construction which later will be described.

In order that the weight of the sash may be balanced there is provided a sash balancer which is mounted in the jamb on each side of the frame and is attachable to the sash. This balancer comprises a housing 9 which in the illustration embodiment is U-shaped in cross-section, having an open face 10 adjacent the base 1 of the frame jamb and having a continuous wall 11 facing the sash, the housing being substantially co-extensive in length with that of the sash.

This housing is removably and slidably mounted in the channel "C" of the frame jamb, being attached at its lower end to a block 12 which is provided with ribs 13 that slide vertically in grooves 14 adjacent the base 1 of the frame jamb. Flanges 14<sup>1</sup> which are carried by the housing in the manner later described slide in the grooves 14 to hold the upper end of the housing in the frame "F" while permitting it to slide.

The upper end of housing 9 may be secured to or detached from the frame jamb by a latch 15 whose structure and operation will be described later. When the sash is closed it will be centred in the window opening by the face 16<sup>1</sup> of the block 12 at its lower end and by a spring clip 17 at its upper end which spring member is attached at 18 to the sash. As the sash is raised the lower end will pass over and above the inclined surface 16<sup>1</sup> of the block 12 and the spring clip 17 will pass beyond the upper end of the housing 9 to such a position, for example, as shown in Figure 2. The sash will then have freedom of lateral movement at which time it may more deeply be moved into a jamb channel and then swung to a removal position.

It is of course to be understood that the structure that is shown in the drawing is

duplicated on the other side of the window.

In order that the housing may be anchored to the frame against sliding movements in the jamb the latch 15 is provided and is pivotally mounted adjacent the upper end of the housing.

In the form illustrated in the drawing, this latch device comprises a slide member 16 carrying the flanges 14<sup>1</sup> which slide in grooves 14 in the window frame. The slide member 16 is attached rigidly to the housing 9 at 18<sup>1</sup> and is located in the channel "C" of the frame jamb. The slide member 16 is comprised by spaced side plates 19. The latch 15 is pivoted between the plates 19 at 20 on a sliding pivot which is capable of sliding vertically in slots 21. The latch 15 is biased into either of the positions shown in Figures 1 and 2 by a spring 21<sup>1</sup> which surrounds a pin 22 that is pivotally attached at 23 to an extension 24 of the latch member. The pin freely operates in a guide member 25 and the spring 21<sup>1</sup> bears against this guide member and the end of the extension 24.

Thus the housing 9, with its attachments at its upper and lower ends comprise, in effect, one complete unit which is movable vertically within the channel "C" of the frame jamb.

A sash balancing spring 26 is located within the housing 9 and is attached at 27 to the housing at the upper end of the spring. The lower end of the spring is attached at 28 to a slide 29 that is located within the housing 9 and is slidable vertically therein. This slide 29 carries a pulley 30 which is movable with the slide. A pair of pulleys 31 and 32 are mounted within the housing 9 on fixed axes (relative to housing).

A flexible elongated member, such as a wire or cable 33, is attached at 34 to the slide 29. This member 33 passes around the pulley 31, thence upwardly and around the pulley 30 and thence downwardly and around the pulley 32. Thence it extends upwardly within the channel "C" of the frame jamb and is detachably engaged at 35 to the base 1 of the frame jamb.

This spring 26 with its mechanism for creating a mechanical advantage which comprises the assembly designated the resilient means normally forces the upper end of the housing 9 into contact with a projection 36 which is rigid with the upper end of the sash "S" and extends into the channel "C" of the jamb to a slight extent.

The latch 15 is provided with a toe portion 37 and a slot 38. The upper edge 39 of the slide member 16 is adapted to engage the slot 38 and the toe portion 37 is adapted to engage the abutment 40 on the frame "F." When the latch is in the position shown in Figure 2 engaging the abutment 40, it is held in this engagement by the reaction of the spring 26. This latch 15 is provided with a thumb-piece 41 so that it conveniently may be manually

operated to swing to operative and inoperative positions.

Describing now the operation of this combination, when the latch 15 is in the position shown in Figure 1, that is to say disengaged from the frame jamb, the spring mechanism forces the housing 9 into contact with the projection 36 on the upper rail of the sash "S", thus tending to move the sash upwardly with the housing.

When manual force is applied to the sash to move the same vertically upwardly the spring mechanism will cause the housing 9 with its latch 15 and spring mechanism to move upwardly with the sash whereas the latch 15 remains in the position shown in Fig. 1, free from the frame "F". Thus the sash will be counter-balanced in its various positions.

The latch 15 will remain in the position shown in Fig. 1 up to the point where a projection 36<sup>1</sup> on the upper end of the sash engages the latch. Further upward movement of the sash causes the projection 36<sup>1</sup> to rock the latch 15 into the angular position shown in Fig. 2. The latch 15 is then in position for engagement with a notch 40. When the latter engagement occurs continuance of the upward movement of the housing 9 is prevented whereas the sash is permitted to continue its upward movement to the position shown in Fig. 2.

It is to be noted that the entire housing with its spring mechanism is at all times and in all positions of the sash located between the sash and the jamb and is substantially co-extensive with the vertical dimension of the sash except when it is disconnected therefrom. This is important because no matter what the position of the sash, the sash balancer will be covered by the sash and will not be visible either on the outside or inside of the window.

When it is desired, however, to remove the sash completely from the window frame, the sash is lowered to its lowermost position and the latch 15 is manually moved into position to engage the frame "F". As the sash is moved upwardly the toe portion 37 of the latch 15 engages the abutment 40 on the frame "F" and the edge 39 engages in the slot 38. The movement of the sash balancer is thus arrested and it is locked in the channel of the window frame "F" against further upward or longitudinal movement. When in its movement upwardly, the lower end of the sash moves to a position above the slide member 16 and the spring clip 17 moves beyond the upper edge of the then stationary housing, the sash may be removed from the frame by moving it toward the housing more deeply into the adjacent frame channel to free it from the opposite frame channel.

It will be realized that it is necessary to lock the upper ends of both of the sash balancers to the opposite jambs of the frame before the sash is removed. However, it might be that

an operator would lock one of the balancers to one jamb and forget to lock the other to its adjacent jamb. Removal of the sash if and when this conditions exists is prevented by the projections 36 on the opposite sides of the sash and the downwardly extending projections 36<sup>1</sup> provided on them which are adapted to engage the upper end of the balancer, preferably the wall of the housing, when an attempt is made to move the sash laterally. These latter projections 36<sup>1</sup> are so correlated with each other and with the spring clips 17 that the lateral movement of the sash will be limited to such an extent that the sash may not be removed until the other unlocked sash balancer has been locked and the sash has been moved upwardly to disengage the projections 36<sup>1</sup> from the upper end of the sash balancer.

It will be realized that if one of the sash balancers is locked to the jamb of the frame in the position shown in Figure 2, for instance, and the other is unlocked from the frame as shown in Figure 1, the sash may be moved upwardly and downwardly with the benefit of only one balancer and the projection 36<sup>1</sup> that is still engaged with the upper end of the operating balancer will prevent lateral movement of the sash sufficient to permit its accidental removal.

Thus it will be seen that a sash balancer combination is provided wherein the sash balancer is completely housed in the channel of the frame jamb and is substantially co-extensive with the vertical dimension of the sash. When the sash is moved upwardly or downwardly the sash balancer moves with it and hence is hidden from view. Moreover, the sash balancer may selectively be connected to the sash, or to the frame; to the sash when it is desired to have it counter-balance the weight of the sash and to the frame when it is desired to remove the window. When the sash balancer is attached to the frame and detached from the sash, the sash itself may be removed without removing the sash balancer, and the sash balancer will remain secured in the channel of the frame jamb ready for re-attachment to the sash when the latter is replaced.

In the drawing, there is illustrated the presently preferred embodiment of the invention and the specification describes this embodiment, but it is to be understood that the claims define that which comprises the invention.

#### WHAT WE CLAIM IS:—

1. A window construction comprising a frame having opposite channelled jambs, a sash slidable in said channelled jambs to positions toward opposite ends of the frame, a sash balancer comprising an elongated housing slidably mounted in the channel of one of said jambs to slide towards either end of said

frame, means on said housing for maintaining said housing within said channel, means for releasably latching said housing to the adjacent jamb against movement longitudinally of said jamb, means on said housing engaging with said latching means to urge it toward its latching position when said sash is moved in one direction and a spring assembly attached to said housing and to said frame biasing said housing in a direction to cause engagement between one end of the housing and one end of the sash.

2. A window construction according to claim 1, wherein said latching means comprises a latch pivoted to said housing and having a portion engageable with an abutment on said frame to limit the movement of said housing in one direction, and wherein said latch is provided with a notch and said housing with a portion engageable with said notch to prevent the movement of said latch in the opposite direction.

3. A window construction according to claim 1 or 2, which includes means spacing said sash from said housing comprising a block member carried by the housing adjacent one of its ends and a spring member carried by the sash adjacent the opposite end, the spring assembly urging said housing longitudinally into engagement with said sash and to bias said sash and said housing in an upward direction and said latching means being operable to arrest the movement of said

housing while permitting said sash to continue an upward movement to such extent that said spring member is moved beyond said housing and said sash is moved out of contact with said block to permit lateral movement of said sash. 35

4. A window construction according to any one of the preceding claims, which includes oppositely extending guiding flanges carried by said housing adjacent one end thereof, the latching means being carried by said housing adjacent the other end thereof, a tension spring assembly located within said housing and attached thereto at one of its ends and an elongated flexible member connected with the opposite end of said spring member and having means on one end thereof for attachment to the window frame, said latching means being pivoted relative to said housing and having means for maintaining said latching means in either of two positions. 40 45 50

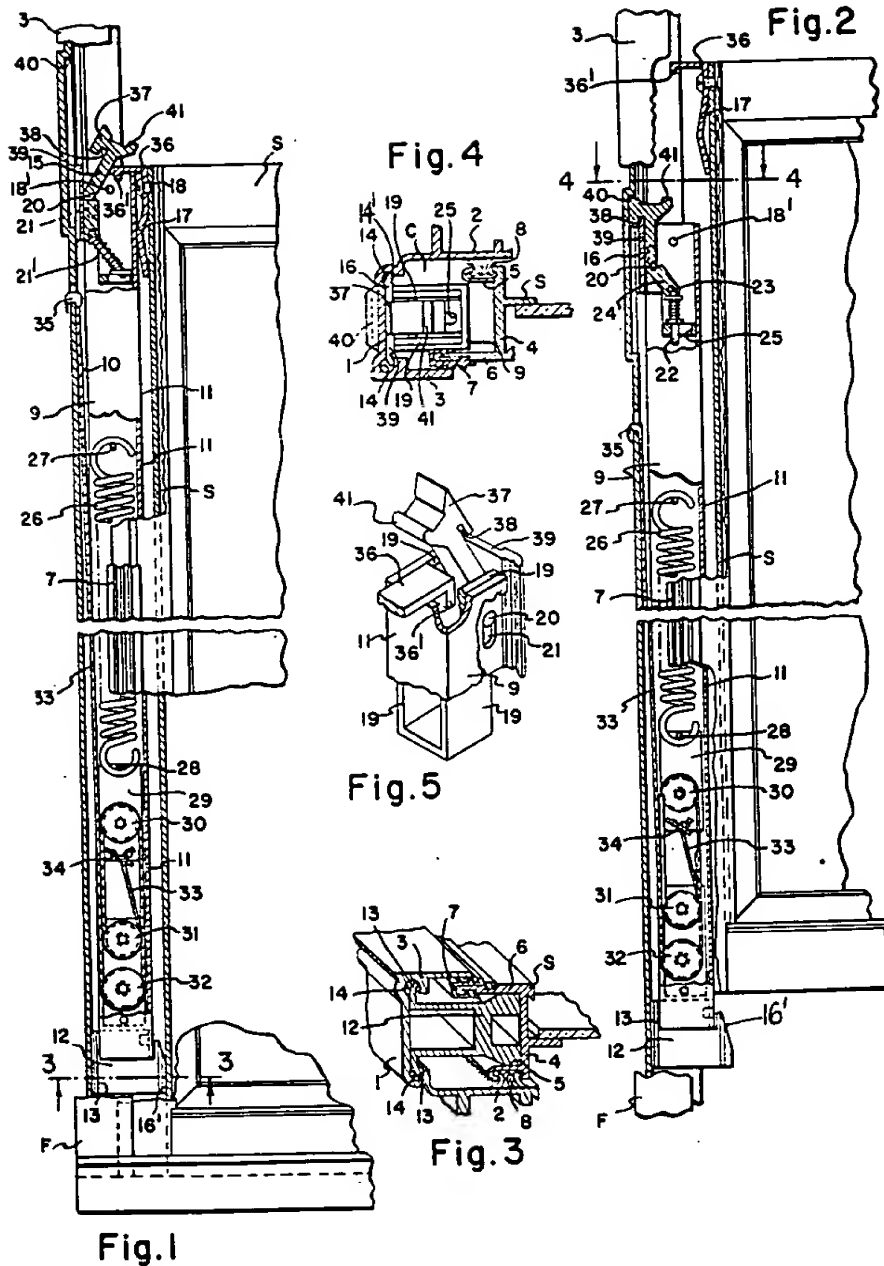
5. A window construction according to claim 4, wherein the latching means is pivotally mounted on a slide member which is capable of slidable motion on said housing. 55

6. A window construction, substantially as hereinbefore described with reference to the accompanying drawings. 60

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